

REMARKS

Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 1-21 are pending in the subject application.

Claims 1-21 stand rejected under 35 U.S.C. §102 and/ or 35 U.S.C. §103.

Claim 9 was canceled without prejudice or disclaimer.

35 U.S.C. §102 REJECTIONS

The Examiner rejected claims 1, 8, 10-13 and 19-21 under 35 U.S.C. §102(e) as being anticipated by Ino et al. [USP 6,424,328; "Ino"]¹. Applicants respectfully traverse as discussed below. The following addresses the specific rejections provided in the above-referenced Office Action regarding specific claim groupings.

CLAIMS 1, 8, 10, 11

Claims 1, 8, 10 and 11 stand rejected as being anticipated by Ino for the reasons provided on pages 2-5 of the above referenced Office Action. Applicants respectfully traverse.

Applicants claim, claim 1, a display device including an active matrix substrate, a counter electrode, a display medium layer that is interposed between the active matrix substrate and the

¹ The remarks in the Detailed Action refer to USP 6,242,328, which was not included with the Office Action nor listed in the PTO-892. As such, Applicants have proceeded on assumption that the reference being referred to is that identified in the remarks for the §103 rejection and in the PTO-892.

counter electrode, and a plurality of pixels. The active matrix substrate includes, *inter alia*, a plurality of pixel switching elements and a plurality of gate lines, where the gate lines are provided to control operations of the pixel switching elements; a plurality of data lines and a plurality of data line switching elements, where each data line is connected to associated ones of the pixel electrodes by way of associated ones of the pixel switching elements so as to supply a data signal therethrough; and a control line that is connected to the data line switching elements. As is described in the subject application, signals are sent over the gates lines to selectively turn ON or OFF the data line switching elements and signals are sent over the control line to selectively turn ON or OFF the data line switching elements. As is also set forth in claim 1, for such a display device the signal(s) being transmitted via the control line to turn the data line switching elements ON and the signals being sent via the gate lines to turn the pixel switching elements ON are such as that the respective ON signals have mutually different polarities.

As described in numerous places within the subject application (*e.g.*, see page 11, paragraph [0017]), the signals to turn ON the data line switching elements and a signal to turn ON the pixel switching elements have mutually different polarities and the data lines and pixel electrodes are formed on the same substrate. Also, the specification indicates that when a potential level on the data lines is raised (or dropped) by the data lines switching elements; a potential level at the pixel electrodes is dropped (or raised) by the pixel switching elements. In other words, a potential rise caused by one of these two types of switching elements is canceled by the potential drop caused by the other type of switching element. Consequently, the voltage being applied to the display medium layer does not change so much even when the switching

elements are turned from ON to OFF. It should be noted that that the potential change caused by the switching elements is referred to as a feedthrough voltage and this feedthrough voltage is not a voltage in the switching elements.

In the above-referenced Office Action, it is asserted with specific reference items Q(n), SL1-3 and Vg of figure 16 of Ino, that these items disclose a signal to turn ON the data line switching elements and a signal to turn ON the pixel switching elements that have different mutually polarities. Applicants respectfully disagree with the characterization of what figure 16 and these reference items in Ino disclose and describe.

The item identified as Q(n) in Ino does not represent the voltage of the signals that are being applied to the data line switching elements and the pixel switching elements in Ino. As is explained in col. 11, lines 4-25 of Ino, Q(n) is the output of the device driver IC 67 that is provided to the data lines. It is further explained in Ino that the output of the driver IC 67 is inverted in polarity every 1H and that these signals have the same polarity as the common voltage (VCOM) within 1H. In sum, there is no discussion anywhere in Ino regarding Q(n) that discloses or describes that the signals being applied to the data line switching elements and the pixel switching elements to turn these switching elements ON have mutually different polarities.

As to the items identified as SL1-3 in figure 16 of Ino, these are the switch control pulses or signals from the switch control circuit 68 that are being applied to the data line switching elements of the corresponding red- green and blue pixel electrodes. Also, the item identified as Vg in Ino is the selection pulse sent from the vertical driving circuit 65 and which control the writing of the display data to the pixels. There is no discussion anywhere in Ino that describes,

teaches or suggests that Vg and SL1-SL3 are controlled so that VG and SL1-SL3 have mutually different polarities when the singles pulses are outputted to turn ON the respective data line switching elements and the pixel switching elements. As to the suggestion, that figure 16 illustrates this, Applicants would note that figure 16 in Ino shows that when data is being outputted to each of the Lth red, green and blue pixels Vg is high and SL1 is high when red display data is being outputted to the Lth red pixel, SL2 is high when green display data is being outputted to the Lth green pixel, and SL3 is high when blue display data is being outputted to the Lth blue pixel. Thus, and contrary to the claimed invention, Ino clearly shows that the *polarities* of the signal pulses or switching element control signals sent to the respective switching elements of the data lines and the pixels *are the same*, not different. Applicants also respectfully submit that such a condition also necessarily would mean that Ino would be operated or function in a manner different than that intended by Ino.

Applicants respectfully submit that the foregoing remarks distinguishing the display device of claim 1 from Ino, also apply to distinguish the display device of claim 8 and the active matrix substrate of claim 10.

It is respectfully submitted that claims 1, 8 and 10 are patentable over the cited reference for the foregoing reasons.

CLAIM 12

Claim 12 stands rejected as being anticipated by Ino for the reasons provided on pages 5-6 of the above referenced Office Action. Applicants respectfully traverse.

Applicants claim, claim 12, a method for driving a display device, which display device includes an active matrix substrate, a counter substrate, which is disposed so as to face the active matrix substrate and includes a counter electrode; and a display medium layer that is interposed between the active matrix and counter substrates. The active matrix substrate includes, *inter alia*, a plurality of pixel switching elements, each said pixel switching element being connected to associated one of the plurality of pixel electrodes, a plurality of gate lines for controlling operations of the pixel switching elements, a plurality of data line switching elements, each said data line switching element having terminals, one of said terminals being connected to associated one of the data lines, and a control line that is connected to the data line switching elements to selectively turn ON or OFF the data line switching elements. Further, a signal to turn ON the data line switching elements and a signal to turn ON the pixel switching elements have mutually different polarities.

Such a driving method includes driving such a display device in such a manner that an interval, in which one of the pixel switching elements is turned OFF to hold a potential level of associated one of the data lines as applied to associated one of the pixel electrodes, overlaps at least partially with an interval, in which one of the data line switching elements that is associated with the data line is turned OFF to hold a potential level of the data signal on the data line, for the pixel electrode and the counter electrode that face each other via the display medium layer.

As indicated in the discussion above regarding the rejection of claim 1, Ino does not disclose, teach or suggest a display device in which a signal to turn ON the data line switching elements and a signal to turn ON the pixel switching elements have mutually different polarities.

As also indicated above, Applicants also respectfully submit that such a condition also necessarily would mean that Ino would be operated or function in a manner different than that intended by Ino. Thus, and at least for this reason, the driving method of claim 12 is considered to be distinguishable from Ino.

As indicated in the discussion above, figure 16 illustrates that when the data line switching elements and the pixel switching elements are turned ON the potential are high. Ino also shows that when the switching element of the red pixel is opened, the Vg signal pulse remains high. It thus necessarily follows that it cannot be said that the respective OFF conditions can overlap.

It is respectfully submitted that claim 12 is patentable over the cited reference for the foregoing reasons.

CLAIMS 13, 19-21

Claims 13 and 19-21 stand rejected as being anticipated by Ino for the reasons provided on pages 6-9 of the above referenced Office Action. Applicants respectfully traverse.

Applicants claim, claim 13, a display device that includes a pair of substrates that is disposed so as to face each other and be spaced apart from each other, a display medium layer interposed between the pair of substrates, and a plurality of pixels, where a plurality of *counter*

signal electrodes, each of which extends in a column direction and through which a data signal is supplied, are formed on one of the pair of substrates. Such a display device also includes a plurality of signal electrode switching elements, each of which is connected to associated one of the counter signal electrodes and controls supply of the data signal to the counter signal electrode.

The other of the pair of substrate includes a plurality of pixel electrodes arranged in matrix, each said pixel electrode being associated with one of the plurality of pixels, a plurality of pixel switching elements, each of which is connected to associated one of the pixel electrodes, a plurality of gate lines, which extend in a row direction and are used for controlling operations of the pixel switching elements and a plurality of common lines, each of which is connected to associated ones of the pixel electrodes by way of associated ones of the pixel switching elements. In such a display device a signal to turn ON the signal electrode switching elements and a signal to turn ON the pixel switching elements has the same polarity.

The Office Actions asserts that Ino discloses having a plurality of counter signal electrodes through which data is supplied provided on the one of the pair of substrates and providing *inter alia* the pixel electrodes, gate lines and common lines on the other of the pair of opposing substrates. As support, the Office Action refers to the discussion in col. 3, lines 11-24 of Ino. Applicants respectfully disagree with this characterization of what is being disclosed in Ino.

The referenced discussion in Ino provides that the display section made up of the gate lines, the signal lines and pixels are formed on a transparent substrate. On the other transparent

substrate there is formed an opposite electrode. It is clear from the further discussion in col. 5, lines 23-27 and col. 9, lines 32-39, that the opposite electrode in Ino is the electrode to which is applied the the common voltage VCOM. As such, the assertion that the opposite electrode corresponds to the plurality of counter signal electrodes of the claimed display device is incorrect. It also follows that since that opposite electrode is the electrode to which the common voltage is applied, Ino also cannot disclose as is claimed by Applicants, having a plurality of common lines on the substrate on which is located the pixels, pixel switching elements and gate lines.

Applicants respectively submit that the foregoing remarks distinguishing the display device of claim 13 from Ino, also apply to distinguish the display device of claim 19 and 21 and the method for driving a display device of claim 20 from the cited reference.

As to claim 20, Applicants make the following further observation. As indicated in the discussion above regarding claim 12, figure 16 illustrates that when the data line switching elements and the pixel switching elements are turned ON the potentials are high. Ino also shows that when the switching element of the red pixel is opened, the Vg signal pulse remains high. It thus necessarily follows that it cannot be said that the respective OFF conditions can overlap. Thus, claim 20 is distinguishable from Ino for this additional reason.

It is respectfully submitted that claim 12 is patentable over the cited reference for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided in MPEP-2131, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

Verdegal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Or stated another way, “The identical invention must be shown in as complete detail as is contained in the ... claims. *Richardson v Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ 2d. 1913, 1920 (Fed. Cir. 1989). Although identify of terminology is not required, the elements must be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). It is clear from the foregoing remarks that the above identified claims are not anticipated by the cited reference.

In deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify *corresponding elements* disclosed in the allegedly anticipating reference (emphasis added, citations in support omitted). *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Company et al.*, 730 F. 2d 1452, 221 USPQ 481,485 (Fed. Cir. 1984). In concluding that the '770 Patent did not anticipate the claims, the Federal Circuit in *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Company et al.*, at 221 USPQ 485-486, further provides that:

The '770 patent discloses an entirely different device,
composed of parts distinct from those of the claimed invention, and
operating in a different way to process different materials differently.

Thus, there is no possible question of anticipation by equivalents.

Citations omitted.

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It is clear from the foregoing remarks, that all of the allegedly corresponding elements disclosed in Ino do not in fact correspond to the elements of the claimed invention. It also is clear that the display device described in Ino functions and operates in a different manner from that of the claimed invention. As also indicated above, the method disclosed and taught in Ino for driving a display device is completely different from the methods claimed and taught by Applicants. Thus, there can be no disclosure or teaching in Ino of Applicants' invention.

It is respectfully submitted that for the foregoing reasons, claims 1, 8, 10-13 and 19-21 are patentable over the cited reference and thus, satisfy the requirements of 35 U.S.C. §102. As such, these claims, including the claims dependent therefrom are allowable.

35 U.S.C. §103 REJECTIONS

Claims 2-7, 9 and 14-18 stand rejected under 35 U.S.C. §103 as being unpatentable over Ino et al. [USP 6,424,328; "Ino"] in view of Ichikawa et al. [USP 6,559,821; "Ichikawa"] for the reasons provided on pages 9-11 of the above-referenced Office Action. Applicants would note that while the summary paragraph 9 of the Detailed Action indicates that the claims are rejected only in view of Ino, Applicants have assumed the rejection is based on the combination of references in view of the remarks that follow in paragraphs 10 and 11 of the Detailed Action. The following addresses the specific rejections provided in the above-referenced Office Action..

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CLAIM 9

As indicated above, claim 9 was canceled in the foregoing amendment. As such, Applicants do not believe that the within rejection need be addressed further herein as to claim 9.

CLAIMS 2-7, 14-18

Claims 2-7 and 14-18 stand rejected under 35 U.S.C. §103 as being unpatentable over Ino et al. [USP 6,424,328; "Ino"] in view of Ichikawa et al. [USP 6,559,821; "Ichikawa"] for the reasons provided on page 11 of the above-referenced Office Action. Applicants respectfully traverse.

Each of claims 2-7 depend directly or ultimately from claim 1 and each of claims 14-18 depend directly or ultimately from claim 13. As indicated in the respective discussions above in connection with the §102 rejections of these claims, Ino does not disclose the display device as set forth in either of claim 1 or claim 13. It also is respectfully submitted that Ino does not teach or suggest a display device as set forth in either of claims 1 or 13. Ino also does not teach, suggest or offer any motivation to modify the display device disclosed in Ino so as to yield the display device as set for in either of claims 1 or 13, nor does Ino provide any indication that such a modification would be reasonably successful. As such, at least because of their dependency from base claim that is considered to be allowable, each of claims 2-7 and 14-18 are considered to be allowable over the combination of Ino and Ichikawa.

As to claims 2 and 15, these claims add the further limitation that each pixel switching element and each data line switching element are thin-film transistors that have substantially the

same channel length. It is further provided that a ratio of a channel width of each pixel switching element to an electrostatic capacitance of associated one of the pixels is substantially equal to a ratio of a channel width of each data line switching element to an electrostatic capacitance of associated one of the data lines. While Ichikawa talks about channel widths and lengths, there is nowhere discussed setting a ratio of a channel width of each pixel switching element to an electrostatic capacitance of associated one of the pixels so it is substantially equal to a ratio of a channel width of each data line switching element to an electrostatic capacitance of associated one of the data lines. As such, it can hardly be said that Ishikawa teaches or suggest modifying the display device of Ino so as to yield the display device of claim 2 or that such a modification would be reasonably successful.

As to claim 4, this claims adds the further limitations that each pixel switching element is an n-channel transistor or a p-channel transistor. Further, if the pixel switching element is an n-channel transistor, each data line switching element is a p-channel transistor, and if the pixel switching element is a p-channel transistor, the data line switching element is an n-channel transistor. While Ichikawa includes discussions of transistors being n-channel or p-channel transistors, there is no discussion or teaching of arranging the pixel switching elements and the data line switching elements with the specific arrangement set forth in claim 4.

As provided in MPEP 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F. 2d 1071, 5

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USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

As provided above, the references cited, alone or in combination, include no such teaching, suggestion or motivation.

Furthermore, and as provided in MPEP 2143.02, a prior art reference can be combined or modified to reject claims as obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 19866). Additionally, it also has been held that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. Further, and as provided in MPEP-2143, the teaching or suggestion to make the claimed combination and the reasonable suggestion of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As can be seen from the forgoing discussion regarding the disclosures of the cited references, there is no reasonable expectation of success provided in the cited references. Also, it is clear from the foregoing discussion that the modification suggested by the Examiner would change the principle of operation of the display device disclosed in Ino.

It is respectfully submitted that for the foregoing reasons, claims 2-7 and 14-18 are patentable over the cited reference(s) and satisfy the requirements of 35 U.S.C. §103. As such, these claims are allowable.

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It is respectfully submitted that the subject application is in a condition for allowance.

Early and favorable action is requested.

Applicants believe that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,
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